

COLUMBIA RIVER TERMINAL FISHERIES RESEARCH PROJECT

9306000

SHORT DESCRIPTION:

Determine the feasibility of creating and expanding terminal fisheries to allow harvest of strong stocks while protecting depressed fish stocks.

SPONSOR/CONTRACTOR: ODFW/WDFW

ODFW/WDFW

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503/657-2000 (Hirose), 360/5

SUB-CONTRACTORS:

Clatsop County Economic Development Council (CEDC)
w/ ODFW

GOALS

GENERAL:

Supports a healthy Columbia basin, Maintains biological diversity, Maintains genetic integrity, Increases run sizes or populations

ANADROMOUS FISH:

Research, M&E

NPPC PROGRAM MEASURE:

8.3C.1

RELATION TO MEASURE:

Responds to specific council amendment language recommending a study of "terminal fishing opportunities to harvest abundant stocks while minimizing the incidental harvest of weak stocks".

OTHER PLANNING DOCUMENTS:

Snake River Salmon Recovery Plan (NMFS): 3.4.b.; Strategy for Salmon, V2 (NWPPC): 5.3C; UPSTREAM: Salmon and Society in the Pacific Northwest (Hatchery changes to assist recovery of wild populations, chap. 6,11,12); Lower Columbia River Terminal Fisheries Project: DOE/EA - 1040.

TARGET STOCK

Lewis River Spring Chinook

Rogue fall chinook

Willamette spring chinook

Col. R. early stock coho

LIFE STAGE

egg to adult

egg to adult

egg to adult

fingerling to adult

MGMT CODE (see below)

A, W

A, W

A, W

A, W

AFFECTED STOCK

Upper Col. R. chinook stocks

BENEFIT OR DETRIMENT

Beneficial

BACKGROUND

Stream name:

Deep River, Steamboat Slough, Cathlamet Channel, Youngs Bay, Tongue Point, Blind Slough, Clifton Channel, Wallace Slough

Stream miles affected:

75

LAND AREA INFORMATION

Subbasin:

Lower Columbia basin and side channels

Land ownership:

Private & Public

Acres affected:

N/A

Project is an office site only

HISTORY:

1992: BPA funded 2-year study of overwinter rearing of coho in Youngs Bay net pens.-Project No. 92-77-Sept., 1992-Jan. 1996-Contract amount \$575,332

1993: Initial year of current project study has resulted in selection of new sites for study at Deep River, Steamboat Slough and Cathlamet Channel in Washington, and Tongue Point, Blind Slough, Clifton Channel and Wallace Slough in Oregon.

1994: Began fish rearing experiments using Willamette stock spring chinook to overwinter in Youngs Bay. Began studies of Rogue stock fall chinook in Youngs Bay. Began extensive water quality and benthic monitoring program at new sites. Began spring and fall test fishery monitoring programs at net sites.

1995: Deep River (Washington), and Tongue Point and Blind Slough (Oregon) were selected for implementation of pilot rearing studies. Capitalization of the new sites with releases planned for coho (1993-95 broods) and spring chinook (1994-96 broods). All monitoring programs continued.

1996: Continued Youngs Bay spring chinook, fall chinook and coho experimental program. Carried out planned rearing studies at Deep River, Tongue Point and Blind Slough sites; coho and spring chinook. All monitoring programs continued. Harvest scenarios implemented and monitored in new release sites ('93 brood coho).

BIOLOGICAL RESULTS ACHIEVED:

Youngs Bay overwintering of 1991 brood coho

Survival rate of "overwintered" coho (2.82%) was greater than coho acclimated for two weeks (0.88%) and coho released from N.F. Klaskanine (0.32%) and S.F. Klaskanine Hatcheries (0.63%). Conclusions regarding survival rate increases due to overwinter rearing are unclear at this time since other factors (time of release) may have been responsible for increased survival. Contribution of "overwintered" coho to the Youngs Bay commercial catch was estimated to be 35,079 fish (60.7% of the total catch).

Low stray rate for overwinter coho (0.6% is similar to 2-week acclimation coho (0.7%) and less than N.F. Klaskanine released coho (2.7%).

Youngs Bay overwintering of 1992 Brood coho

Preliminary coded-wire tag recovery data indicate survival rate (percent and comparison), contribution to Youngs Bay commercial catch (50.8%), and stray rate (<1%) to be similar to the 1991 brood coho data.

Initial returns in 1996 of 1993 Brood coho resulted in harvest of approximately 2,500 coho at each of the new release sites: Deep River, Tongue Point and Blind Slough. Data are presently being evaluated and compiled for Youngs Bay fishery.

PROJECT REPORTS AND PAPERS:

Annual report covering 1994 was submitted to BPA.

Draft of the 1995-96 report is in progress, with a draft date being November 1, 1997 and a final date of January 1, 1998.

Semi-annual reports for the Youngs Bay terminal fishery project have been written and submitted to BPA. A Completion Report was submitted in January, 1997.

ADAPTIVE MANAGEMENT IMPLICATIONS:

Information gained from this study will be used by fisheries managers in setting time, gear, and area restrictions for sites with production potential. Harvest goals of 100% of the production from net pens can be pursued without impacting weak or endangered stocks.

Study sites are providing areas in the lower Columbia River where viable sport and commercial fisheries can occur without impacting rebuilding efforts for endangered upriver salmon stocks

PURPOSE AND METHODS

SPECIFIC MEASUREABLE OBJECTIVES:

The long-term goal of this study is to determine specific sites and areas that can support viable sport and commercial harvest without impacting weak stocks. The measurable objectives would be in terms of economic benefits and quantifying biological impacts on weak and endangered stocks while staying within specific impact levels.

From 1992-2003 this project will test the efficacy of overwinter rearing of coho, spring chinook, and fall chinook in Youngs Bay net pens. From 1995-2003 rearing and harvest fish in new terminal areas is planned, with Deep River, Tongue Point and Blind

Slough sites implemented in 1995.

CRITICAL UNCERTAINTIES:

Annual funding uncertainty of this 10-year project affects planning and securing of study fish from hatchery programs. Marine mammals and avian predation could affect outcomes.

BIOLOGICAL NEED:

Continual harvest of healthy hatchery stocks will be optimized while reducing harvest rates on weak, endangered stocks in mixed stock, mainstem fisheries.

HYPOTHESIS TO BE TESTED:

Development of terminal fishing opportunities in the lower Columbia River will support productive sport and commercial fisheries on harvestable stocks without negatively affecting rebuilding efforts directed at weak stocks.

ALTERNATIVE APPROACHES:

N/A

JUSTIFICATION FOR PLANNING:

N/A

METHODS:

Project design is simply to utilize hatchery fingerling production for acclimation and rearing in lower Columbia River off channel areas with studies designed to determine which rearing variables (size, release time, rearing densities, release sites) would maximize survival, minimize straying, optimize economic benefits, while best utilizing hatchery production and minimizing weak stock impacts.

Monitoring of water quality at sites using a Hydrolab multiparameter water testing device, and benthic monitoring seasonally using standard grabber and laboratory methods.

Standardized fish husbandry methods and net pen construction established from experience in Youngs Bay is the procedure used. Coded wire tagging (CWT) and finclipping of representative numbers of each study group is conducted with methods standardized coastwide. Recovery of CWTs is a product of a coordinated coastwide effort and essential for study evaluation.

Determination of background level of non-targeted stocks is accomplished using contract fishermen in each terminal site. Data are compared using a measure of catch per unit of effort.

Analysis of data generated by returns of adult study fish will be based on CWT recoveries. Statistical comparisons will be done utilizing existing standard methodology inclusive in the CWT recovery program.

Present studies include the rearing, release and harvest of the following salmon stocks and numbers:

1994-96 brood fall chinook (Rogue stock)	750,000/Yr.
1993-96 brood spring chinook (Willamette R. stock)	475,000/Yr.
1994-96 brood spring chinook (Willamette R. stock)	450,000/Yr.
1993-96 brood coho (early stock)	600,000/Yr.
1993-96 brood coho (Grays R. stock)	200,000/Yr.

PLANNED ACTIVITIES

SCHEDULE:

Planning Phase	Start 1993	End 1995	Subcontractor N/A
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Task The Goal of the project is to determine the feasibility of creating and expanding terminal, known stock fisheries in the Columbia River Basin to allow harvest of strong anadromous salmonid stocks while providing greater protection to depressed fish stocks.

Implementation Phase **Start** 1993

End 2003

Subcontractor CEDC w/ ODFW

- Task**
1. Survey and categorize potential terminal fishing sites in the Columbia River basin for basic physical characteristics (high, medium, low).
 2. Determine the capability of the medium and high terminal fishing sites for rearing and acclimating anadromous fish species in net pens or other facilities.
 3. Determine the capability of the medium and high terminal fishing sites to allow manageable and economically competitive harvest of returning fish.
 4. For the medium and high terminal fishing sites, determine the potential for harvest of target and non-target fish species.
 5. Evaluate the suitability of various anadromous fish stocks for use in the medium and high terminal fishing sites.
 6. Determine the generic costs and logistics of a large-scale net pen rearing program (overwinter rearing and short-term acclimation) and estimate the variables for each of the medium and high terminal fishing sites.
 7. Evaluate the effects of a large-scale net pen rearing program (overwinter rearing and short-term acclimation) for terminal fishing on hatchery production programs.
 8. Determine the effects on upriver fish runs, escapement, and Zone 6 fisheries of shifting various levels of historical Zone 1-5 commercial fisheries to terminal sites.
 9. Coordinate activities of ODFW, WDFW, CEDC, BPA, NMFS and Salmon for All (SFA).

PROJECT COMPLETION DATE:

2003

CONSTRAINTS OR FACTORS THAT MAY CAUSE SCHEDULE OR BUDGET CHANGES:

Availability of hatchery juveniles and funding for full implementation of the project.

Site availability, permit processes at all levels, agency coordination.

Continuation of poor juvenile survival conditions in the ocean could cloud study conclusions and direction.

OUTCOMES, MONITORING AND EVALUATION

SUMMARY OF EXPECTED OUTCOMES

Expected performance of target population or quality change in land area affected:

Weak upriver target populations are expected to increase by shifting harvest from traditional mainstem fisheries to offchannel terminal areas.

Comparison of survival rates of net pen released fish with traditional hatchery releases. Expected outcome is increased survival rates to support successful terminal harvest.

Stock composition of harvest in new terminal areas. Expectations are for favorable results (few non-local stocks and high percentage of targeted stocks).

Favorable documented effects of fish rearing programs on water quality standards.

Analysis of escapement data to document stray rates (expected compliance with Wild Fish Plan).

Long-term expectations are for an economically successful sport and commercial fisheries that can function independently and without impedance to recovery of weak and endangered upriver salmon runs

Present utilization and conservation potential of target population or area:

N/A - Terminal Fisheries project does not address utilization and conservation potential of the target population (ESA or weak stocks).

Assumed historic status of utilization and conservation potential:

N/A - Terminal Fisheries project does not address utilization and conservation potential of the target population (ESA or weak stocks).

Long term expected utilization and conservation potential for target population or habitat:

N/A - Terminal Fisheries project does not address utilization and conservation potential of the target population (ESA or weak stocks).

Contribution toward long-term goal:

This project minimizes harvest impacts on target populations (ESA or weak stocks).

Indirect biological or environmental changes:

Interactions with other species, changes in water quality.

New supplemental food sources for estuarine salmon predators.

Physical products:

Harvest of tagged and untagged fish in terminal areas and other fisheries.

Series of net pen complexes and associated structures (pens, pilings, docks).

Environmental attributes affected by the project:

No environmental attributes anticipated to be affected.

Changes assumed or expected for affected environmental attributes:

No environmental attributes anticipated to be affected.

Measure of attribute changes:

N/A - Does not apply to this project.

Assessment of effects on project outcomes of critical uncertainty:

Critical uncertainties assessed through continual monitoring of water quality, macroinvertebrates and harvest scenarios.

Continual monitoring of environmental and biological processes.

Information products:

Discussion and analysis at bi-monthly meetings, and regularly produced project reports.

Coordination outcomes:

Interagency meeting and reporting of project results, with appropriate collaboration at all levels (SFA business plan, research).

MONITORING APPROACH

The project's biological and environmental outcomes should be measured through tangible results specified in the project tasks.

Product delivery can be regionally assessed through the realization of creation or expansion of known stock fisheries in the Columbia River basin to allow harvest of strong anadromous salmonid stocks while providing greater protection of depressed fish stocks.

Provisions to monitor population status or habitat quality:

Both agency and project funds are being utilized to monitor water quality and weak stock status through extensive CWT programs.

Data analysis and evaluation:

Evaluation of survival, contribution and distribution data is based on PSMFC regional CWT recovery programs. Analysis of water quality and benthic data utilize baseline and control data bases.

Information feed back to management decisions:

Adaptive management scenarios for production and harvest will be based on project findings.

Critical uncertainties affecting project's outcomes:

Additional research into factors affecting survival rates (predation; disease; oceanic, river & estuarine conditions; etc) may be necessary.

EVALUATION

Successful terminal fisheries will demonstrate high survival rates, high terminal harvest rates, compliance with wild fish and environmental policies, and low impacts on weak stocks.

Incorporating new information regarding uncertainties:

New information will be analyzed with all data as they become available, being scrutinized and incorporated into the adaptive management process where applicable.

Increasing public awareness of F&W activities:

Public awareness will be increased through direct public involvement and by fully utilizing the news and information media to increase and educate public awareness of the potential of terminal fisheries to protect weak stocks while optimizing the harvest of strong stocks.

RELATIONSHIPS
RELATED BPA PROJECT

8906600

8906900

8201300

RELATIONSHIP

Monitoring

Monitoring

Monitoring

RELATED NON-BPA PROJECT

Lower Columbia River Salmon Business Plan for Terminal Fisheries (BPA)

Coho Production (CEDC)

Lower Columbia River Enhancement Group (WDFW)

Rearing and release of Rogue River stock fall chinook (ODFW Restoration & Enhancement)

Rearing and release of upriver bright fall chinook (PSMFC)

RELATIONSHIP

Economic Feasibility Study

Terminal Fishery Expansion

Terminal Fishery Development

Terminal Fishery Development

Terminal Fishery Development

OPPORTUNITIES FOR COOPERATION:

Coordination and approval for reprogramming of fish stocking programs is essential at all levels; internal within WDFW and ODFW, in forums or individually with other agencies, and within requirements and guidelines of the ESA and Production Advisory Committee (PAC). NEPA requirements have been met however an EIS may be needed. Permits with Oregon Department of Environmental Quality (DEQ) and Washington Department of Ecology (WDOE) are necessary along with local county and other state agencies. Lease agreements with private landowners are necessary.

Commercial harvest regulations require Columbia River Compact action in concurrent waters and states' action in state waters. Coordination with the appropriate enforcement agencies is essential at all levels; internal within WDFW and ODFW, in forums or individually with other agencies, and within requirements and guidelines of the ESA and Production Advisory Committee (PAC). NEPA requirements have been met however and EIS may be needed. Permits with Oregon Department of Environmental Quality (DEQ) and Washington Department of Ecology (WDOE) are necessary along with local county and other state agencies. Lease agreements with private landowners are necessary.

Commercial harvest regulations require Columbia River Compact action in concurrent waters and states' action in state waters. Coordination with the appropriate enforcement agencies is essential.

Sport harvest proposals must be reviewed by enforcement and coordination between the states (OR & WA) for consistency.

All harvest must be addressed in the ESA process involving the Technical Advisory Committee (TAC) of the Columbia River Fish Management Plan as author of biological assessments concerning fishery impacts. Final approval of fisheries and harvest are then the responsibility of the National Marine Fisheries Service (NMFS).

COSTS AND FTE

1997 Planned: \$785,000

FUTURE FUNDING NEEDS:

<u>FY</u>	<u>\$ NEED</u>	<u>% PLAN</u>	<u>% IMPLEMENT</u>	<u>% O AND M</u>
1998	\$900,000		60%	40%
1999	\$1,500,000		60%	40%
2000	\$1,500,000		55%	45%
2001	\$1,500,000		40%	60%
2002	\$1,500,000		25%	75%

PAST OBLIGATIONS (incl. 1997 if done):

<u>FY</u>	<u>OBLIGATED</u>
1993	\$417,855
1994	\$393,825
1995	\$400,000
1996	\$785,881
1997	\$664,676

TOTAL: \$2,662,237

Note: Data are past obligations, or amounts committed by year, not amounts billed. Does not include data for related projects.

OTHER NON-FINANCIAL SUPPORTERS:

Oregon Governor's Office, NMFS, BPA, ODFW, WDFW, NWPPC, EDA, SFA, CRFPU, OSU, Local Counties, City of Astoria, Tongue Point Job Corps, Local Businesses & Individuals

LONGER TERM COSTS: 2003: \$1,500,000; continuing in years to follow at the same level
10-year project continues through 2003

1997 OVERHEAD PERCENT: ODFW - 20%; WDFW - 19%

HOW DOES PERCENTAGE APPLY TO DIRECT COSTS:

ODFW: Personal Services, and Services & Supplies; WDFW: All Costs excluding fish food & capitalized equipment.

CONTRACTOR FTE: In 1997: 8 (ODFW 5, WDFW 3)

SUBCONTRACTOR FTE: In 1997: 4 FTEs employed by CEDC (subcontractor w/ODFW)